The double red clump of the Milky Way bulge has nothing to do with an X-shaped structure!

Young-Wook Lee\textsuperscript{1}, Sohee Jang\textsuperscript{1}, Jaeyeon Kim\textsuperscript{1},
Daniel Han\textsuperscript{1}, Chul Chung\textsuperscript{1} and Seok-Joo Joo\textsuperscript{2}

\textsuperscript{1}Center for Galaxy Evolution Research & Department of Astronomy, Yonsei University, Seoul, Korea
\textsuperscript{2}Korea Astronomy and Space Science Institute, Daejeon, Korea
email: ywlee2@yonsei.ac.kr

Because ...

1. The double red clump (RC) observed in high latitude field of the Milky Way bulge (McWilliam & Zoccali 2010; Nataf et al. 2010) is another manifestation of helium-enhanced multiple stellar population phenomenon (Lee et al. 2015; Joo et al. 2017).

2. In the metal-poor regime of the bulge, the same phenomenon is observed as two sequences of RR Lyrae stars (Pietrukowicz et al. 2015) on the period-amplitude diagram (Lee & Jang 2016; Jang & Lee 2015).

3. The required helium enhancement ($\Delta Y/\Delta Z = 6$) for the second generation stars is naturally predicted by chemical evolution models (see Kim & Lee, this volume).

4. The observed spread in [Na/Fe] among bulge RGB stars is 2-3 times larger than that of the disk (bar) population, and is consistent with our chemical evolution models (see Kim & Lee, this volume).

5. The claimed X-shaped structure from WISE residual map (Ness & Lang 2016) is most likely an artifact or exaggeration. Even if it is real, the stellar density in the faint X-shaped structure is way too low to be observed as the double RC (see Han & Lee, this volume).

6. The observed difference in I magnitude between the RR Lyrae stars and the RC ($\sim 0.55$ mag) is consistent with our multiple population models.

7. There is also no evidence for the X-shaped structure from RR Lyrae stars, main sequence stars & Mira variables (Pietrukowicz et al. 2015; López-Corredoira 2016, 2017).

References